

Remarks

Claims 1 and 6-10 are pending. Claims 2-5 are currently canceled. Reconsideration of the application is respectfully requested.

§ 103 Rejections

Claims 1 and 6-10 are rejected under 35 USC § 103(a) as purportedly being unpatentable over Nakamura (U.S. 6,335,076) in view of Toriumi (U.S. 6,590,070). The Examiner has stated that Nakamura et al. teaches a “thermo-adhesive” sheet that is used to bond circuit board layers together. The adhesive sheet has through vias that have low melting solder in them. The Examiner has also acknowledged that Toriumi teaches a “thermo-adhesive” with a methacrylate copolymer that is useful in electronic devices. The Examiner has stated that the instant invention claims the use of a “thermo-adhesive” with a methacrylate copolymer. It is the Examiner’s position that it would have been obvious to one of ordinary skill in the art to have used a methacrylic “thermo-adhesive” as the adhesive of Nakamura in order to form a good bond with the circuit pattern because of the teaching of Toriumi. The Examiner has further stated that selection of pressure and temperature conditions for bonding is taken as being within the ordinary skill of the art absent unexpected results.

The Examiner has stated that both Nakamura and Toriumi teach a thermo-adhesive sheet and a thermo-adhesive. Applicants have examined both Nakamura and Toriumi and can find no reference to either a “thermo-adhesive sheet” or a “thermo-adhesive”. The Applicants respectfully request that the Examiner further define what is meant by these terms.

With respect to claims 1 and 7, the Applicants’ claims recite a thermosetting adhesive sheet having two major surfaces, composed of a thermosetting adhesive composition having a melt coating temperature of between 60°C and 120°C, comprising ethylene-glycol (meth)acrylate copolymer and a rosin, said rosin containing a carboxyl group, and having at least one through-opening region formed at a prescribed location, low melting solder placed within at least one through-opening region formed at the prescribed location, and that there is a molten bond between the solder and the adhesive composition. For the sake of this argument the Applicants will assume, without admission, that the Examiner considers a thermo-adhesive to be a

thermosetting adhesive. It is the Applicants' position that the Examiner has not shown that Nakamura teaches, suggests, or describes a thermosetting adhesive sheet having the properties recited in Applicants' claims 1 or 7. More specifically, the Examiner has not shown that Nakamura teaches, suggests, or describes a thermosetting adhesive having a melt coating temperature of between 60°C and 120°C. Furthermore, the Examiner has not shown that Nakamura teaches, suggests, or describes an ethylene-glycidyl (meth)acrylate copolymer and a rosin. Nakamura is directed towards a plurality of double-sided circuit boards in which a circuit is provided on either side of an insulating layer (abstract). The thermosetting adhesive sheet of Nakamura has a melt coating temperature of 220°C (col. 8, line 53) and is identified as being a polyimide, epoxy, or mixture thereof (see col. 6, lines 6-17). Finally, the Applicants teach (see page 3, line 21 to page 4, line 2 of the specification of the application as filed) that the thermosetting adhesive sheet is useful for adhesion of electronic elements such as semiconductor elements onto radiator plates and refer to the adhesive sheet on page 12, line 25 as a "heat radiating adhesive sheet". The Examiner has not shown that Nakamura teaches a heat radiating adhesive sheet. The adhesive layer of Nakamura has a bore opened at a predetermined position in direct contact with the wiring conductors of two double-sided circuit boards (see col. 2, lines 40-50). The bore portion is provided with a soldered electric conductor, in which two double-sided circuit boards are **electrically connected** by said soldered electric conductor (emphasis added). The Examiner has not shown where Nakamura teaches, suggests, or discloses an adhesive sheet that is thermoconductive or is a heat radiating sheet as required by Applicant's adhesive sheet.

The Examiner is relying on Toriumi to provide the missing elements in Nakamura to get Applicant's claims 1 and 7. The Examiner has not shown that Toriumi teaches, suggests, or discloses a heat radiating or thermoconducting adhesive sheet. According to MPEP § 2141, when applying 35 U.S.C. 103, the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination and the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention. The Applicants respectfully note that it is only with hindsight vision afforded by Applicants' claimed invention that the Examiner has made this combination by, e.g., selecting and

substituting and guided by the present disclosure. For at least this reason, the Examiner has not shown that one of ordinary skill in the art, absent guidance from the present disclosure, would combine the teachings of Toriumi with Nakamura to get something close to the claimed invention. Thus, the Examiner has not made a *prima facie* case of obviousness and the rejection of claims 1 and 7 under 35 USC § 103(a) as purportedly being unpatentable over Nakamura in view of Toriumi is improper and should be withdrawn

Claims 1 and 7 are in condition for allowance. Claim 6 and 9 depend upon and add additional limitations to claim 1. Since claim 1 is now in condition for allowance, likewise so are claims 6 and 9. Claims 8 and 10 depend upon and add additional limitations to claim 7. Since claim 7 is now in condition for allowance, likewise so are claims 8 and 10. The rejection of claims 1 and 6-10 under 35 USC § 103(a) as being unpatentable over Nakamura in view of Toriumi has been overcome and should be withdrawn.

In view of the above, it is submitted that the application is in condition for allowance. Reconsideration of the application is requested.

Respectfully submitted,

28-March-2008

Date

By: /Dean M. Harts /

Dean M. Harts, Reg. No.: 47,634

Telephone No.: 651-737-2325

Office of Intellectual Property Counsel
3M Innovative Properties Company
Facsimile No.: 651-736-3833

DMH/SFW/spg